



SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FOUNDED IN 1969

A NONPROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED
TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1800 MC.

W6IFE Newsletter

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At the **4 December 2003** meeting of the SBMS, Dave, WA6CGR will talk about "Places in Southern California to contest from". The SBMS meets at the American Legion Hall 1024 Main Street (south of the 91 freeway) in Corona, CA at 1900 hours local time on the first Thursday of each month. Check out the SBMS web site at <http://www.ham-radio.com/sbms/>.

Last Meeting- Dick, K6HIJ had a good general talk about what test equipment the microwave ham needed to have on his bench using \$1000 as maximum funds available. Thanks Dick.. It was agreed to move the SBMS 2 GHz and Up contest to third weekend in May (15-16 May 2004). Trying to find a weekend that would not have bad weather for the central and east coast contesters and missing Mothers day and other holidays as well as other contests. Welcome to new members, Scott Carpenter, K0SMC of Long Beach; Jack Dickinson, N6PI of Santa Barbara; Alwyn Broadus, K6EMC of Riverside; and David Pedersen, N7BHC of Mentone. 27 people present.

Christmas get together- The 13th of December. The "Microwave Swap Meet" will begin at 1:30 PM followed by drinks and general partying until dinner at 6:00 PM. I will provide the Turkey and everyone should sign up to bring an entree, fixing's or dessert.

The directions are as follows: Get to the Harbor Freeway (110) and go south to Pacific Coast Highway. Exit PCH and turn Left. Go under the Freeway and continue East on PCH. Go past the First signal (Figueroa) to Wilmington Blvd. (2nd Signal). Turn Left at Wilmington Blvd. (North) about three blocks, past Q St. to 1646 Wilmington Blvd. I will try and arrange parking with the Church to use one of their parking lots (more later). The phone number at the shop is 310-549-6622. Dave, WA6CGR

SBMS meeting parking- We have become a great number of members at meetings. I had a talk with the Pastor of the church of which we use for parking on our meeting night. He indicated that there was a problem with parking in his lot. He said that he had given permission to a hospital group to park there. He suggested that we park on the street and or in the lot across the street. He indicated that he had permission to park his over-flow church folks in that lot. The sign on the building shows: 1025 Main Street. MAIN STREET BISTRO. The sign on the parking lot says: CLIN CHIROPRACTIC CARE

I told him we would put the info in our newsletter, but that it mite take a month before everyone got the word. I think if we make every one park next to the church building side of the church parking lot and the North side for his group, this may work out. Dick, WB6DNX

Activity reported at the November SBMS meeting- Dick, WB6DNX is working on a dual band feed; Chip, N6CA had recording of contacts with Dave, WA6CGR through rain-scatter. Both stations were using omni antennas on 10 GHz. Chip will be pushing his home omni up to 18 ft; Pat N6RMJ built a DEMI 2mtr to 10 mtr transverter and did a microwave WSWSS presentation; Mike, W6YLZ built a 2 mtr to 10 mtr transverter; Dave, WA6CGR is building a DN6MT 10 GHz transverter, had noise problems with the reflock board, and made a WSWSS presentation; Dick K6HIJ is back working on a 24 GHz waveguide switch; N7EME has the PLL 1152 MHz board problem fixed; Doug, K6JEY has a new spectrum analyzer; Ed K6ODV has a WORKING 10 GHz rig now; Larry, KG6GE has W6SYA' 10 GHz rig on the air; Glenn, KE6HPZ did a bunch of contact on the non-contest event; Wayne, KH6WZ wrote more articles; Ken. W6DTA worked the non-contest; Kerry, N6IZW is working on 47 GHz drawings; Bill, WA6QYR has been working on his Pcom 24 GHz rig; Chuck, WA6EXV repaired the Heaps beacon, but snow will delay its return to hill; Chris, N9RIN played with the HP dc-dc converters; Mel, WA6JBD found a TWT.

Scheduling:

8 January (note first Thursday is 1 Jan) Mike Collis, WA6SVT "ATV on microwave"

5 February John Hoot, "Astronomy and microwaves".

"Wants and Gots for sale"

Want Manual for Boonton 190 Q-meter Dick Kolbly K6HIJ 760-253-2477

Want WR-42 waveguide relay Dave WA6CGR 909-318-5154.

Want waveguide relay for 24 GHz, and a 24 GHz isolator- Miguel W6YLZ 818-349-8525

Want- noise source- John KJ6HZ 909-683-1434

Want MACOM 10 GHz dish N6RMJ 661-264-1978

Off the Internet--

Hi all-I'd like to report what I believe to be a first for QSOs above 400GHz here in the US. (DB6NT was first on the "band" at 411GHz with a 50-meter QSO). On Nov 11, 2003 at 02:15z WA1ZMS/4 worked W4WWQ/4 on a frequency of 403GHz over a distance of 0.521km.

W4WWQ/4 was located at: 37-21-14.1 79-10-13.6

WA1ZMS/4 was located at: 37-21-23.6 79-10-31.1

The weather at the time of the QSO was: Temp: 3.9C, Dew Point: 1.1C, Relative Humidity: 82%, Station pressure: 1006mb. The weather conditions result in a total atmospheric loss of 14.4dB per km!

Gear used for the QSO was the same basic gear used for our 241GHz QSOs last year but this time with new 30cm parabolic dishes. The feeds used on the parabolas are W2IMU horns designed for 241GHz, so the feed is over-moding and thus not optimal on 403GHz. When colder and dryer winter WX arrives, we have hopes of trying to break the 1km distance barrier. I hope to have photos and .wav files posted at www.mgef.org sometime very soon.

Although any QSO above 300GHz is considered the same "band" by some, I would think that a QSO in the 400GHz range would be of interest to several people active on microwaves and just wanted to report it.

73, Brian, WA1ZMS/4

Hi all (again!)-The cold and dry WX was calling and we just had to try to break our own World DX record of 11.4km on 241GHz. Here are the specifics of the new claimed 34.9km record:

Date: Nov 14th, 2003 Time: 01:57z Distance: 34.9km

WA1ZMS/4 FM07fm 37-31-19.3N 79-30-14.4W

W4WWQ/4 FM07ji 37-21-14.1N 79-10-13.6W

The weather at the time of the QSO at the WA1ZMS/4 QTH: Temp: -3.3C, Dew Point: -14.4C, Relative Humidity: 42%, Station pressure: 874mb The WX conditions result in a total atmospheric loss of 0.673dB per km.

The weather at the time of the QSO at the W4WWQ/4 QTH: Temp: 3.3C, Dew Point: -12.2C Relative Humidity: 31%, Station pressure: 992mb. The WX conditions result in a total atmospheric loss of 0.820dB per km. The WX conditions being different at each end of the QSO make for some interesting predicted signal margin calculations. The actual measured signal margin on the WA1ZMS/4 end was as high as 13dB. The wind was very strong at both locations and that made for some signal fading. Photos and .wav file will be forthcoming. (My sincere apologies as well to those on the reflector who may be tired of hearing about all these DX records.)

73,Brian, WA1ZMS/4

Food for thought: Many guys out here have been brought into the microwave ranks by the extra efforts of WA6CGR, N6XQ, W6DTA & KE6HPZ and others who have made several "loaner" X-band rigs. These rigs have been used every year by newcomers and invariably the newcomers have got bitten by the microwave bug. Our increase to more than 60 active stations on x-band out here is a direct result of these loaner rigs and the ever-increasing enthusiastic activity of Microwavers. We just recently had an unscheduled "non-contest" Saturday contest. Nine stations were on x-band from home and attempted to work each other. Contacts were made out to 100 miles running omni antennas from these home locations. Now others are going to get home stations & antennas up and running. This approach really works. 73 Chip N6CA

From ARRL Headquarters Newington CT November 19, 2003

To all radio amateurs SB QST ARL ARLB065

ARLB065 FCC adds Part 15 spectrum at 5 GHz, turns down ARRL request

The FCC has made another 255 MHz of spectrum available in the 5.470-5.725 GHz band for unlicensed Part 15 National Information Infrastructure (U-NII) devices, including Radio Local Area Network (RLAN) devices. In a Report and Order in ET Docket 03-122 released November 18, the FCC said it was taking the action to alleviate

crowding in existing allocations and to align U-NII bands in the US with bands elsewhere in the world. The FCC turned down an ARRL request to keep U-NII devices out of the 5.650 to 5.670 GHz segment to avoid interference with the Amateur Satellite Service. Amateur Radio has a secondary allocation from 5.650 to 5.925 GHz.

"We are not persuaded that we should either add or modify our proposed rules as requested by ARRL," the FCC said, adding that its dynamic frequency selection (DFS) and transmitter power control (TPC) requirements "will in fact protect amateur operations," although they're not specifically designed to do so.

Commenting in the proceeding September 3, the ARRL expressed concerns about "potential aggregate interference" from U-NII devices to Amateur Radio space stations in the 5.650-5.670 GHz band. The League did support other elements of the FCC's proposals, however, including a power limitation of 1 W EIRP, and said hams were willing to cooperate with the RLAN industry on other sharing-related issues.

In its comments, the League said the amateur allocation at 5.650 to 5.925 MHz "has been subject to 'death by a thousand cuts.'" The FCC's most recent action leaves Amateur Radio with "relatively uncompromised access" to a 25-MHz segment at 5 GHz--5.825 to 5.850 GHz, the ARRL said. That includes a 20-MHz-wide satellite downlink segment, 5.830 to 5.850 GHz. Federal government users are primary over the entire band.

The Commission said that because of the large amount of spectrum it's adding to the 300 MHz of spectrum already available for U-NII devices, it expects the density of devices to be relatively low. "We believe that this low density of devices coupled with our technical requirements will provide adequate protection to all incumbent systems in the band, including amateur satellite uplink systems," the FCC said.

The R&O culminated a 2002 Petition for Rule Making from the Wireless Ethernet Compatibility Alliance (WECA), now known as the Wi-Fi Alliance. NNNN

Giddy All, can someone please "Post via the Reflector" (in order to minimize MULTIPLE responses/Emails) the SSB Calling Frequency used in your 76 GHz Band? What IF's are mostly used on this Band? Are US (rest of the world) Amateurs who are currently using 76 GHz going to have to move UP to 77/78 GHz as per this Website? www.iaru-rl.org/pdf/vhf-apr-2001.pdf.

Reason - I have stumbled onto a considerable amount of surplus SPECTRAPOINT 2000 RF gear for LMDS on 28 GHz. The Company SPECTRAPOINT...has now ceased trading hence the SURPLUS. LMDS is a Broadband Wireless Network that is just starting to gain popularity around the globe. This gear includes many 28 GHz Tx and Rx pole mounted units (requiring L Band IF In & 10 MHz Ref) and fitted with integrated Andrews Sector Antenna's having about 21 dBi of gain. The RX units have a Model Nr RX2000-28-xx. The RX/TX blocks contain several pcs of what should be R Band WG fittings: WR-28. In EACH of these TX/RX units there is/are a 26-27 GHz Oscillator block (4 inch cube) module made by MICROSOURCE INC. I cannot locate any Spec's on these specific blocks but a little "story" on their development can be found here...<http://www.microsource-inc.com/ptsynth.pdf>. They are parallel programmed & lock back to 10 MHz Reference. The Tx units contain a lovely little UP-Converter module made by Nanowave Technologies on a heavy brass substrate. It is fed with an unknown L Band IF (900-1400 MHz) via RG174 or similar. This is mixed with the 26/27 GHz Osc injection and is coupled directly to the WR-28 WG towards the Antenna which looks like a Horn. The module Specs shows it delivers +31 dBm @ 26-28 GHz. or more than 1 Watt!!! Here's the Spec's: <http://www.nanowavetech.com/DataSheets/Subsystems/LMDSUC.pdf>

There are also many little 10-12 inch or so dishes made by Bosch/Richardson's which although they look Paraboloidal (complete with Radomes) are probably Offset (unfortunately) because they are fed inside the radome from underneath rather than Prime Focus. These dish units require 15V @ 2 Amps & have "F" connectors for RX/TX Disable so I'm not sure what's happening with these. Maybe RX only?? / They have a Model No RTU2000-28-2 My thinking is (subject to the programming issues/difficulties) that these 26-27 GHz Oscillator modules may be useful as Injection Oscillators or Signal Sources x3 for the 76-78 GHz band. Ditto the TX UP CONVERTERS (Mixers) on 76-78 GHz via a times 3 multiplier AND OR maybe even 24 GHz but the latter needs to be tested. Any thoughts/interest? Cheers. Alan - VK3XPD Melbourne, Australia.

Alan-This is a topic that has come up before and the short answer is that there currently is no agreed upon calling frequency in that band. Part of the problem may stem from the fact there is no globally agreed frequency as of yet either, and because of that people have made the best use of what parts they have on hand when building equipment.

Here are some of the frequencies that have been used by various hams on the band:

80.640GHz (Proposed)

76.032GHz (French freq, but off-limits in the USA)

75.976GHz (UK freq)

78.192GHz (Some Northeast USA hams)

75.860GHz (My old WA1ZMS freq)

It looks like some of us will have to "move" if we wish to arrive on a common frequency.

I'm currently working on updating my gear, but my motivation is technical in nature. I'd like to be near the top of the band where the oxygen loss is lower, and I'd like my frequency reference to be something that can be directly synthesized from a 10MHz OCXO. (ie: 110, 112, 115MHz etc...) I can get orders of magnitude better phase noise and stability over a VHF crystal oscillator even if it's phase locked. But that's my take. Others will have input as well. 73, Brian, WA1ZMS/4

More from the net--

From the unofficial results I calculated the following interesting numbers.

East coast: Average score: 13,471

Median score: 9,204

% of stations as 10G and UP: 35%

of stations: 49

points per station*: 275

West coast: Average score: 49,400

Median score: 33,230

% of stations as 10G and UP: 20%

of stations: 64

points per station*: 519

Non-coast: Average score: 20,235

Median score: 15,506

% of stations as 10G and UP: 18%

of stations: 39

points per station*: 519

Key: east coast is regions 1, 2, 3, 8, 15

west coast is regions 6, 7, 20

Non-coast is regions 0, 4, 5, 9

(*) - This was calculated by dividing the average score by # of participants

What does this mean? Well for one thing it means that this region of North America kicked butt! And it's not just that the average score is high because of the Mexico operations, but the median score is also way higher here. However, we are sorely lacking in the number of 10 GHz and up entries! The east coast guys have over 1/3 of stations on 24 GHz or higher. We could gain many points by adding on 24 GHz to our operations. (Assuming we learn to work that band well, and we may well be behind in that respect). In terms of efficiency, we do just as well as the mid-west guys, which given the geography makes some sense. However with the Mexico shots, we could have done considerably better by better roving by more stations.

Just thought those might be some interesting figures....Tony KC6QHP (who got a dismal score this year :)

Dear All, The UP part of the contest is everything above the 10ghz band. For that reason, in terms of score, being on any one of the higher bands puts you in the UP category. However, your total score is entered from all bands- your 10 GHz score is added to your, say, 24GHz score. So, pick your band and get on the air. Even a 1km contact can put you in the UP category. At this point we probably have 6 or more stations on narrow band 24ghz, a dozen perhaps that can do 24 wide band, and several working in San Diego who are on 47ghz. Not sure about the higher bands. If you are interested in pursuing the higher bands. Get your radio together and then test how well it works before the contest. **DON'T GO OUT WITH A COMPLETELY NEW RADIO!** Do a can't fail short distance QSO then go for the gold. Figure out how to know what frequency you are on out in the field and if you are really transmitting. Finally- there are lots of pieces and parts around and there are a number of labs that can test up to 78 GHz for frequency, power and spectrum. Noise figure at least to 26 GHz is also available. If you can build it- it will work.

Good luck-and let people know what you are working on and what you need help with. We want you on the air as much as you do. 73, Doug K6JEY

At the risk of repetition here is my opinion on the original list of suggestions:

- 1) Don't mess with the basic 10-Up contest as "it ain't broke". Improvements in scoring to encourage higher freq. activity is fine.
- 2) More microwave band activity is needed so look at similar contests, i.e. maybe a 2-to-6 (GHz) contest similar to the 10-Up?
- 3) Airborne category...well OK but scored as a separate class.
- 4) Microwave repeaters.... OK but again a separate class.
- 5) Satellite and EME. I don't think they should be added. EME Contesting already exists to stimulate activity and I think it is not really compatible with the distance home-portable-rover character of the current contest. Ditto for satellites. BTW contesting is somewhat frowned down on satellite operation. If there is a microwave EME or Satellite Contest...they should be separate. They are generally home-based operations (with a few DX-pedition and portable exceptions). Really hard to compare terrestrial with space-born scores (i.e. try WAS on 10 GHz without either).
- 6) Discussion about regional differences (terrain and climatic) ...goes with the territory! Always has. Live with it!

I live in a mountainous state (size of 2-1/2 times Texas) with two or three micro waver population. I'll not win any contest with my local population...ever! Most of our mountains are only accessible by helicopter at \$800/hour! If I want to "win", then go where the maximum odds are for the contest weekend. The oil and airline industry need your dollars...LOL! Otherwise, operate the best you can where you are (accept the local challenge...make microwaves!). Now maybe more weekends is not a bad idea...maybe one weekend a quarter (Spring-Summer-Fall-Winter)...somewhere that will be a good time for someone. Maybe chose 3 out of 4 per year for the cumulative (your choice).

7) How about an APRS location spotting class of operation (re: Ev Tupis)?

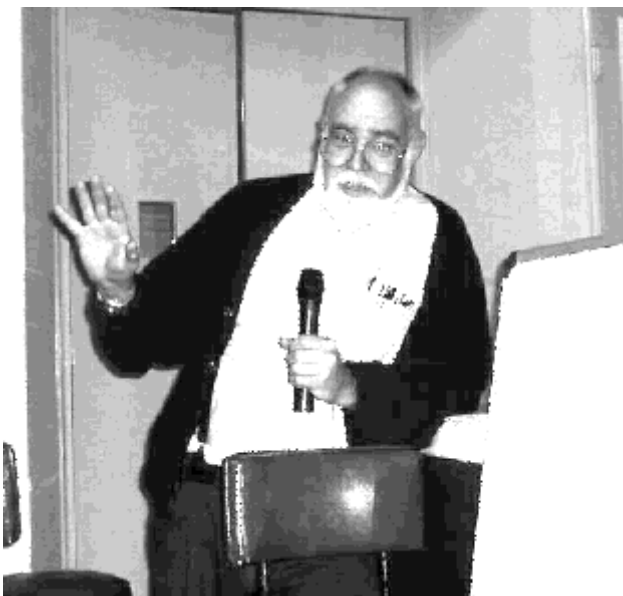
My two-cents!

73, Ed - AL7EB 50 MHz - 24 GHz 2m-EME AO-40 sat.

I've been reading this interesting thread and there's two themes emerging:

- o Increasing activity
- o Changing the scoring (presumably to increase activity)

IMHO, at the end of the day, it boils down to the simple question of how to increase activity. Granted, having a contest makes a lot of activity, but only for two weekends a year. What about the other 50 weekends? Are contests the only way to generate activity? I like the idea proposed by w3iy and w3hms about having a Microwave Activity Day on the first Saturday of each month. This is not a contest but a day where it is well known that people will be dragging their radio out to those hills, beaches, mountaintops, maybe even planes! Since there is no contest, we don't have to worry about how many grids a rover covers. We don't have to worry about the northeast always winning. (BTW, if you go by the rumored scores for the September VHF contest on the NEWS site, it looks like a couple of rovers in California came out on top this time, not someone in the northeast.) We don't have to worry about whether transmitting our location digitally is self-spotting. Essentially, we don't need no steenkin' rules to tell us what we can or can't do. What we do have to worry about is simply getting out there, operating, making some noise and having fun! This equates to activity in my book.... And, we've just taken care of 12 of those 50 weekends. The remaining 38 sound like a good time for those honey-do's and to build the gear to drag out on the first Saturdays. 73, Mark, N2MH The Lighthouse Rover



(above) Dick, K6HIJ presenting his talk on simple and old test equipment techniques at the November meeting.

Notes from Dick Kolbly, K6HIJ's talk on use of older test equipment at the November SBMS meeting.

Assuming you only had \$1000 to set up your shop for microwave measurements, what would you want to have?

Some sort of voltage measuring meter, DVM and an analog meter. It is hard to make measurements tuning up something if the meter is always switching scales and auto-ranging. This is where an analog meter is good to have. DVM's tend to have problems on electronic hilltops.

Some sort of variable voltage power source to supply B+ or 12v +/- to the item under test.

Some way to measure power. The old HP 430 power meters were good if you are good at making "quick" measurements. The 431 and later are better with being stable for periods of time. This is good for the milliwatt range but you need to have some attenuators that can handle some power to make "watt" level measurements. You may want to have some not so accurate attenuators to handle the high power levels and a "good" set of attenuators when you want to make more accurate measurements.

A variable "IF" frequency attenuator is nice to have if you need to set a random signal level to match something with to get within a ballpark.

A signal source is good to have. Having a set of the older boat anchor HP 61x series from 2 to 11 GHz is good for what most of us want to check amplifiers or cheap way to check out receivers. Their stability isn't good for narrow band work, but useful. Having a 1000 Hz AM modulated signal source can be useful in that you can use a good coupler (good directivity), crystal detector, and an HP 415 VSWR meter (really a tuned audio amplifier with a meter and attenuator) and measure return loss or VSWR of something. With a short and a good dummy load, one can calibrate the 415 for return loss. Then putting the item under test at the end of the coupler, you get some idea of the match of the item. Add a double stubbed tuner and one can get a better feel for the impedance of the item. This set up is a reflectometer, a previous version of what is now a network analyzer. The signal source is single frequency so you have to move frequency and make another measurement. If you have later signal generators that provide frequency verses voltage output now you can with a plotter make swept frequency measurements. Even later equipment you can display either linear or smith chart impedance pictures.

Having some means to measure frequency is good to have. Older "wavemeters" are good since they cover a wide frequency range. At least the HP units did. The old military wavemeters usually had a limited range of coverage, but still useful. An HP 5245 is easy to come by at swap meets for twenty bucks. Plug-ins extend the range of these up to 12 GHz. Frequency accuracy isn't top of the line laboratory, but useful. Measurements don't have to be made in coax. Waveguide equipment is just as good as the coax kind but takes a little more bench space.

Having a DC coupled oscilloscope is nice to have when checking signals in amplifiers and rigs.

An 1152 MHz source that has lots of harmonics is nice to have when checking out transceivers on various ham bands. Even running it into a crystal detector mount and generating the waveguide band of frequencies is useful weak signal source on a hilltop to check that the rig is working. Some of the Qualcomm boards were good for that.

Chip, N6CA suggested that taking initial voltage and current measurements on an item under test is useful as the tune up or tweaking process goes on.

Thanks Dick for the talk.

73's Bill

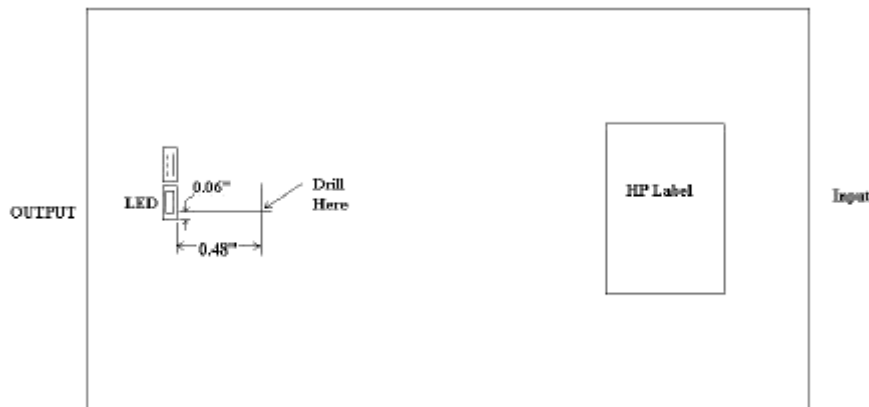
Hi, this is for everyone that got the HP F1064A dc/dc converters. I took some measurements for hole needed to access VR1 on the board. This is the pot that controls the output voltage. I made a little sketch of where the hole needs to be made (at least on the one I took apart) in the case. I have not tried this yet on my other units. Hopefully, I can drill the rest tomorrow. When you make the hole, keep in mind that there is a transformer close by (about .150" away) and you will need to be careful when drilling. Keep the drill bit size under .250" and you should not hit the transformer when using a drill press. Also, if your converter stops working, there is a fuse on

the input side. Unfortunately, it is inside the box instead of in the lighter plug. Somebody did not think ahead on that one.

Hope this helps, Chris n9rin

Hmmmm. I think a safer procedure would be to saw the case open along the seam (Dremel Moto-Tool, or similar) and gain access to the fuse and the pot. The case can then be drilled for pot-access (that sounds funny), and the fuse re-located to a more sane location. I wonder how many of these things get tossed out because of a blown, non-accessible fuse?? What a devious, profit-making scheme!

Wayne KH6WZ



(above) Wayne, KH6WZ (right) sorting out the power-pole purchase for Chris, N9RIN. A number of SBMS members are going to this connector for the main 12v input.

The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 90 amateurs from Hawaii and Alaska to the east coast and beyond. Dues are \$15 per year, which includes a badge and monthly newsletter. Your mail label indicates your call followed by when your dues are due. Dues can be sent to the treasurer as listed under the banner on the front page. If you have material you would like in the newsletter please send it to Bill WA6QYR at 247 Rebel Road Ridgecrest, CA 93555, bburns@ridgecrest.ca.us, or phone 760-375-8566. The newsletter is generated about the 15th of the month and put into the mail at least the week prior to the meeting. This is your newsletter. SBMS Newsletter material can be copied as long as SBMS is identified as source.

San Bernardino Microwave Society newsletter

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